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collectors and the magnetic field so that magnetic field lines are directed substantially parallel to a direction of current flow in a region where the plurality of current collectors contact the armature conductor turns to reduce induced magnetic forces on the current collectors.

In the Claims:

Please SUBSTITUTE the following amended claims for the like numbered pending claim:

1. (Amended) A homopolar machine comprising:
a shaft;
an armature assembly, coupled to the shaft, that includes a plurality of armature conductor turns;
an outer flux return that encloses the armature assembly;
a plurality of stator-current collector arrays, coupled to the outer flux return, that encircle the armature assembly, each stator-current collector array including a plurality of current collectors that provide a sliding electrical current interface with the armature conductor turns; and
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means for maintaining substantially constant contact pressure of the current collectors with the armature conductor turns in the presence of high magnetic fields produced by superconducting field coils.

2. (Amended) A homopolar machine comprising:
a shaft;
an armature assembly, coupled to the shaft, that includes a plurality of armature conductor turns;
an outer flux return that encloses the armature assembly; and

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a plurality of stator-current collector arrays, coupled to the outer flux return, that encircle the armature assembly, each stator-current collector array including a plurality of current collectors that maintain substantially constant contact pressure with the armature conductor turns in the presence of high magnetic fields to provide a sliding electrical current interface with the armature conductor turns;

wherein the outer flux return comprises a geometry that directs magnetic field lines substantially parallel to a direction of current flow in a region where the plurality of current collectors contact the armature conductor turns to reduce induced magnetic forces that may deflect the current collectors.

3. (Amended) A homopolar machine in accordance with claim 1, wherein each of the current collectors comprises a solid material.

4. (Amended) A homopolar machine in accordance with claim 1, wherein each of the current collectors comprises a flexible, electrically conductive material.

Please ADD the following NEW claims:

9. (New) A method of operating a homopolar machine, comprising the steps of:

rotating an armature assembly that includes a plurality of armature conductor turns;

creating a magnetic field through the armature assembly;

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providing a plurality of stator-current collector arrays that encircle the armature assembly, each stator-current collector array including a plurality of current collectors which provide a sliding electrical current interface with the armature conductor turns;

reducing induced magnetic forces that may deflect the current collectors by directing magnetic field lines substantially parallel to a direction of current flow in a region where the plurality of current collectors contact the armature conductor turns; and

maintaining substantially constant contact pressure between the plurality of current collectors and the armature assembly in the presence of the magnetic field.

10. (New) A method in accordance with claim 9, wherein the step of creating a magnetic field through the armature assembly comprises the step of creating a magnetic field through the armature assembly with superconducting field coils.

11. (New) A method in accordance with claim 9, wherein each of the current collectors comprises a solid material.

12. (New) A method in accordance with claim 9, wherein each of the current collectors comprises a flexible, electrically conductive material.

13. (New) A method in accordance with claim 9, wherein each of the current collectors comprises electrically conductive fibers made from copper.

14. (New) A method in accordance with claim 9, wherein each of the current collectors comprises electrically conductive fibers made from copper alloys.

15. (New) A method in accordance with claim 9, wherein each of the current collectors comprises electrically conductive foils made from copper.

16. (New) A method in accordance with claim 9, wherein each of the current collectors comprises electrically conductive foils made from copper alloys.

17. (New) A method of operating a homopolar machine, comprising the steps of:

energizing superconducting field coils in the homopolar machine to create a magnetic field through an armature assembly that includes a plurality of armature conductor turns;

supplying current to a plurality of current collectors that provide a sliding electrical current interface with the armature conductor turns; and

maintaining an orientation of the plurality of current collectors and the magnetic field so that magnetic field lines are directed substantially parallel to a direction of current flow in a region where the plurality of current collectors contact the armature conductor turns to reduce induced magnetic forces on the current collectors.

18. (New) A method in accordance with claim 17, wherein each of the current collectors comprises a solid material.

19. (New) A method in accordance with claim 17, wherein each of the current collectors comprises a flexible, electrically conductive material.